3G MOBILE SERVICES

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ABSTRACT

This paper represents the underlying paradigms of third generation (3G) mobile services. The 3G mobile networks and applications are faced with a lot of expectations such as providing simple access to online services via mobile terminals. Third generation (3G) is the latest wireless technology. It is also known as UMTS (Universal Mobile Telecommunication System), an improvement over second generation (2G) providing wireless access to data and information to the users from anywhere and anytime. This paper develops a framework that presents the factors which contribute to the success of third generation (3G).

Keywords: User Acceptance, 3G, Mobile Services, Communication

I INTRODUCTION

Many studies have investigated the success factors and user acceptance of third generation(3G) mobile network and its services. 3G mobile protocols support the high data rates which can be measured in kbps(kilobits per second) or mbps(megabits per second). The shifting from 2G to 3G, not only provides users fresh ways to communicate but also a variety of new services such as- browsing the internet, e-mail, instant messaging, video conferencing and digital television at very higher speed. 3G also makes guidance, presence and location based services available to the mobile users.Since 2001, 3G trials across the world have shown that the main development from 2G to 3G is the faster connection speed, referring to wider bandwidth. The main characteristics of 3G are to provide mobile multimedia services at a transmission rate of 144 kbps at the high speed. In addition, 3G network can offer faster data transmission than the slowest LAN connection (256 kbps) and GPRS (General Packet Radio Service) that usually offers transfer speed of 40 kbps to 55kbps.

1 Speed of 3G mobile technologies is higher than other generation of technologies in India.
2 Smart phones are more suitable for using 3G technologies than mobile phones in India.
3 3G mobile technologies focus more on internet facility than other facility.
4 Additional facilities like video calling, mobile television, telemedicine, improved music quality etc are having edge over other generation technologies.
5 Using applications in 3G handsets are more complex than other 2G handsets.
6 3G phones have some hardware and software faults.

II PRICING

Pricing of 3G services is one of the biggest challenges faced by telecommunication companies. Setting the right price for service usage is very difficult. For example MMS (Multimedia SMS) has suffered from high pricing. However many mobile operators provides discounts for MMS services. For this, mobile operators have used two types of pricing. First, pricing can be based on fixed price, in this operators usually offer 100mbps transfers per month. This means that a user can send and receive normal sized documents 50 times per month. If usage exceeds 100mbps in a month, the price will be increased. This pricing is the most common pricing strategy for mobile data services. Second, usage based pricing imposes a fee based n the amount of data send and receive. Users have to pay only to the services they actually use.

2.1 First Generation

1G analog system for mobile communications saw two key improvements during the 1970s: the invention of the microprocessor and the digitization of the control link between the mobile phone and cell site. AMPS (Advance mobile phone system) was first launched by US which is 1G mobile system. It is best on FDMA technology which allows users to make voice calls within one country.

2.2 Second Generation

2G digital cellular systems were first developed at the end of the 1980s. These systems digitized not only the control link but also the voice signal. The new system provided better quality and higher capacity at lower cost to customers. GSM (Global system for mobile communication) was the first commercially operated digital cellular system which is based on TDMA.

2.3 Third Generation

3G systems promise faster communications services, including voice, fax and Internet, anytime and anywhere with seamless global roaming. ITU's IMT-2000 global standard for 3G has opened the way to enabling innovative applications and services (e.g. multimedia entertainment, infotainment and location-based services, among others). The first 3G network was deployed in Japan in 2001. 2.5G networks, such as GPRS (Global Packet Radio Service) are already available in some parts of Europe. 3G technology supports 144 Kbps bandwidth, with high speed movement (e.g. vehicles), 384 Kbps (e.g. on campus) & 2 Mbps for stationary (e.g. in building).

2.4 Fourth Generation

At present the download speed for mode data is limited to 9.6 kbit/sec which is about 6 times slower than an ISDN (Integrated services digital network) fixed line connection. For third generation mobile (3G, FOMA) data rates are 384kbps (download) maximum, typically around 200kbps, and 64kbps upload since spring 2001. Fourth generation (4G) mobile communications will have higher data transmission rates than 3G. 4G mobile data transmission rates are planned to be up to 20 megabits per second. Before understanding 4G, we must know what is 3G ? 3G initiative came from device manufactures, not from operators. In 1996 the development was initiated by Nippon Telephone & Telegraph (NTT) and Ericsson; in 1997th Telecommunications Industry Association (TIA) in the USA chose CDMA as a technology for 3G; in 1998 the European Telecommunications Standards Institute (ETSI) did the same thing, and finally, in 1998 wideband CDMA (W-CDMA) and cdma2000 were adopted for the Universal Mobile Telecommunications System(UMTS). W-CDMA and CDMA

2000 are two major proposals for 3G. In this CDMA the information bearing signal is multiplied with another faster rate, wider bandwidth digital signal that may carry a unique orthogonal code. W-CDMA uses dedicated time division multiplexing (TDM) whereby channel estimation information is collected from another signal stream. CDMA 2000 uses common code division multiplexing (CDM) whereby channel estimation information can be collected with the signal stream. Access Technologies (FDMA, TDMA, CDMA)

- **FDMA:-**Frequency Division Multiple Access(FDMA) comprises of all algorithms allocating frequencies to transmission channels according to the FDM. With FDMA, only one subscriber at any given time is assigned to a channel. The channel therefore is closed to other conversations until the initial call is finished, or until it is handed-off to a different channel. A "full-duplex" FDMA transmission requires two channels, one for transmitting and the other for receiving. FDMA has been used for first generation analogy systems.
- **TDMA:-**Time Division Multiple Access (TDMA) improves spectrum capacity by splitting each frequency into time slots. TDMA allows each user to access the entire radio frequency channel for the short period of a call. Other users share this same frequency channel at different time slots. The base station continually switches from user to user on the channel. TDMA is the dominant technology for the second generation mobile cellular networks.
- **CDMA:-**Code Division Multiple Access is based on "spread" spectrum technology. Since it is suitable for encrypted transmissions, it has long been used for military purposes. CDMA increases spectrum capacity by allowing all users to occupy all channels at the same time. Transmissions are spread over the whole radio band, and each voice or data call are assigned a unique code to differentiate from the other calls carried over the same spectrum. CDMA allows for a " soft hand-off" , which means that terminals can communicate with several base stations at the same time.

III BEYOND 3G

In the field of mobile communication services, the 4G mobile services are the advanced version of the 3G mobile communication services. The 4G mobile communication services are expected to provide broadband, large capacity, high speed data transmission, providing users with high quality colour video images, 3D graphic animation games, and audio services in 5.1channels. We have been researching the vision of 4G mobile communication systems, services, and architectures. We also have been developing the terminal protocol technology for high capacity, high speed packet services, public software platform technology that enables downloading application programs, multimode radio access platform technology, and high quality media coding technology over mobile networks.

IV REASONS TO HAVE 4G

1. Support interactive multimedia services: teleconferencing, wireless Internet, etc.
2. Wider bandwidths, higher bit rates.
3. Global mobility and service portability.
4. Low cost.
5. Scalability of mobile networks

V INTERNET ON MOBILE

Browsing the Web from Mobile a wide range of authors from various disciplines ranging from technology to business have argued that the 3G will enable mobile access to the Internet , or in other words, aim to merge cellular networks and the Internet meaning that mobile users can have ubiquitous access to all the services that the Internet provides from messaging to browsing. The term mobile Internet, or Internet in mobile, refers to gaining access to the Internet using a handheld, wireless device like a mobile phone or PDA. As 2G networks have been mainly voice-centric with low data transmission capacity, 2,5G and 3G will speed up data transmission speeds. However, in 3G networks the data transmission speed is depend upon the number of users accessing the network at the same point of time.

Thus, in reality 3G networks rarely offer the theoretical maximum speed. Another question relates to the users need to browse the Web from mobile. Besides the most used mobile Internet services in 2,5G, namely news and entertainment, the question of whether there are any other online services that are preferably used from mobile rather than from other devices such as laptops which have larger screens and also easier to use interfaces with large keyboards, remains open. However, the question of whether users are willing to browse the Internet from mobile phone or PDA becomes unimportant as terminals are only devices, and finally the user judges the terminals and chooses the one he or she prefers. For instance, by using 3G data card users can browse the Internet via their laptop or via a mobile device. The purpose of use dictates the terminal in the end.

Research has suggested that the most attractive WAP applications are news, entertainment, ticketing and reservations, as well as banking. These are actually among the most common online services used with computers as well. To conclude, while many 3G services are operated via the Internet, browsing the Internet from mobile phones or PDAs will not be a mobile version of fixed-line access. In fact, people do not use the Internet in the same way from mobile terminals as they do when accessing the Internet via larger screens from computers. France Telecom Research & Development (2004) predicts that mobile Internet offers the advantage of always being near at hand, and of being a personal tool. On this basis possible successful services might be services developed for travelling purposes like ticketing, checking schedules, traffic reports and related services.

VI CONCLUSION

Today, the majority of mobile services used via 3G networks are already available in current 2,5G networks (GPRS, EDGE) such as browsing the Web, sending and receiving multimedia messages (like pictures and video), and e-mailing. Therefore, 3G should not be viewed as a new technology surpassing the existing 2,5G networks, or evolution in mobile communication. Instead, 3G should be considered to be evolution of existing mobile communications. In the light of the discussion in this paper, there is strong evidence to suggest that the main outcome of using 3G networks and services will be to get access to the same services with faster data connection speed. Furthermore, it seems that the success of 3G lies in its ability to serve not only mobile users but in providing access to the Internet with data cards inserted in laptops.

Thus, 3G networks will serve the same purpose as LAN and WLAN networks. In terms of business opportunities, telecommunication companies main source of income is still coming from voice-centric services. For example, the mobile operator Hutchinson, offering services purely in 3G networks, announced this autumn

2004 that its main source of income comes from discount packets that offer free speech time in 3G networks. Moreover, as long as the price of the network time is high in 3G, operators cannot wait fast diffusion of data centric mobile services. According to mobile operators, 3G is needed in congested places where the demand on current mobile networks exceeds the capacity. Another important factor affecting future of 3G is the availability of reasonably priced handsets.3G devices launched to the market during2004 have also suffered from various problems such as high power consumption that limits usage time.

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